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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,059	07/24/2001	Yukio Kyusho	P/3236-29	6066

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EXAMINER	
MONBLEAU, DAVIENNE N	
ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 12/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/915,059	KYUSHO ET AL.	
	Examiner	Art Unit	
	Davienne Monbleau	2878	MW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-34,39,40,43-45,48-50,53-57,60-64,67-70,73-78,81-84,87-92,95-98* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-34,39,40,43-45,48-50,53-57,60-64,67-70,73-78,81-84,87-92,95-98* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

The amendment filed on 10/3/03 has been entered. Claims 1, 2, 35-38, 41, 42, 46, 47, 51, 52, 58, 59, 65, 66, 71, 72, 79, 80, 85, 86, 93 and 94 have been canceled. Claims 3, 6, 9, 13, 17, 20, 24, 27, 31, 39, 40, 44, 45, 49, 50, 56, 57, 63, 64, 69, 70, 77, 78, 83, 84, 91 and 92 have been amended. Claims 3-34, 39, 40, 43-45, 48-50, 53-57, 60-64, 67-70, 73-78, 81-84, 87-92 and 95-98 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically teachd or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 4, 6, 7, 9, 10, 11, 13-15, 17, 18, 20-22, 24, 25, 27-29, 31-33, 39, 40, 44, 45, 49, 50, 56, 57, 63, 64, 69, 70, 77, 78, 83, 84, 91 and 92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view of Smart (US 6,281,471).

Regarding Claims 3 and 39, Rieger et al. teach in Figure 12 a Q-switched mode-locked pulsed laser (2) directed towards a target (118). Rieger et al. do not teach pulse slicing. Smart teaches in column 11 lines 42-52 that pulse slicing the output of a laser and in column 16 lines 15-22 that said pulse slicer is an optical modulator. It would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse slicing in Rieger et al., as taught by Smart, to attenuate laser energy remaining at the output of the laser processing system when the seed laser pulse is terminated, thereby preventing heating of sensitive structures not designated as target material after processing is complete. (See Smart column 5 lines 45-49). Rieger et al. do not teach repairing a defect in a pattern. Smart teaches in column 1 lines 15-32 various applications for said laser, including repair operations. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the laser in Rieger et al. for repair processing, as taught by Smart, since Smart teaches in column 3 that high speed pulsed lasers (which are required for repair processing) may be Q-switched lasers with mode-locked operation.

Regarding Claims 6 and 44, see discussion on Claim 3 above. Rieger et al. further teach in Figure 12 an optical amplifier (103).

Regarding Claims 9 and 49, see discussion on Claim 3 above. Rieger et al. further teach in Figure 8 and in column 7 lines 45-67 a laser pulse multiplexing and delaying unit.

Regarding Claims 13 and 56, see discussion on Claim 3 above. Rieger et al. further teach in Figure 12 an optical amplifier (103) and in Figure 8 and in column 7 lines 45-67 a laser pulse multiplexing and delaying unit.

Regarding Claims 17 and 63, see discussion on Claim 3 above. Rieger et al. further teach in Figure 12 a wavelength-converting unit (112).

Regarding Claims 20 and 69, see discussion on Claim 3 above. Rieger et al. further teach in Figure 8 and in column 7 lines 45-67) a laser pulse multiplexing and delaying unit and in Figure 12 a wavelength converting unit (112).

Regarding Claims 24 and 77, see discussion on Claim 3 above. Rieger et al. further teach in Figure 12 an optical amplifier (103) and a wavelength-converting unit (112).

Regarding Claims 27 and 83, see discussion on Claim 3 above. Rieger et al. further teach in Figure 8 and in column 7 lines 45-67 a laser pulse multiplexing and delaying unit and in Figure 12 an optical amplifier (103) and a wavelength-converting unit (112).

Regarding Claims 31 and 91, see discussion on Claim 3 above. Rieger et al. further teach in Figure 8 and in column 8 lines 45-67 a laser pulse multiplexing and delaying unit and in Figure 12 a double-pass optical amplifier (103) and a wavelength-converting unit (112).

Regarding Claims 4, 7, 10, 14, 18, 21, 25, 28, and 32, Rieger et al. teach in column 6 lines 65-67 100 ps pulses.

Regarding Claims 11, 15, 22, 29, and 33, Rieger et al. teach in column 7 line 55 that the delay is between 100 ps and 10 ns.

Regarding Claims 40, 45, 50, 57, 64, 70, 78, 84, and 92, Rieger et al. teach in Figure 6 a q-switched mode-locked pulse laser comprising a resonator, a pumping unit (61), a Nd:YAG laser medium (67), a Q-switching element (73), and a mode-locker (75).

Claims 5, 8, 12, 16, 19, 23, 26, 30, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view of Smart (US 6,281,471), as applied to Claims 3, 6, 9, 13, 17, 20, 24, 27 and 31 above, and further in view of Unternahrer et al. (US 6,404,787). Rieger et al. in view of Smart do not teach setting the slicing in an arbitrary manner. Unternahrer et al. teach in Figure 1 a laser apparatus for selecting a predetermined number of pulses comprising an optical modulator (128) with a controller (126). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a controller in Rieger et al. in view of Smart, as taught by Unternahrer et al., to control the optical modulator when slicing pulses to achieve a desired pulse shape.

Claims 43, 48, 53, 60, 67, 73, 81, 87, and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view of Smart (6,281,471) and Unternahrer et al. (US 6,404,787), as applied to Claim 5 above, and further in view of Amada et al. (US 5,710,787). Rieger et al. do not teach a remote controller. Amada et al. teach in Figure 1 a remote controller (11) to control the laser (1). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a remote control in Rieger et al., as taught by Amada et al., to remotely control various aspects of a laser source, such as the delay unit. Additionally, modifying computer controllers (such as 126 in Rieger et al.) to be responsive to a remote control is standard in the art.

Claims 54, 55, 61, 62, 74, 75, 88, 89, 96, and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view Smart (6,281,471), as applied to Claims 49, 56, 63, 69, 83 and 91 above, and further in view of Amada et al. (US 5,710,787). Regarding Claims 54, 61, 74, 88 and 96, Rieger et al. teach in column 6 lines 65-67 100 ps pulses but do not teach a remote controller. Amada et al. teach in Figure 1 a remote controller (11) to control the laser (1). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a remote control in Rieger et al., as taught by Amada et al., to remotely control various aspects of a laser source, such as the delay unit. Additionally, modifying computer controllers (such as 126 in Rieger et al.) to be responsive to a remote control is standard in the art.

Regarding Claims 55, 62, 75, 89, and 97, see discussion on Claim 54 above.

Claims 68, 76, 82, 90, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rieger et al. (US 5,790,574) in view of Smart (US 6,281,471), as applied to Claims 63, 69, 77, 83 and 91 above, and further in view of Rieger et al. (US 5,742,634). Rieger et al. '574 teach in Figure 12 producing second harmonic wavelengths (112), but do not teach third, fourth, or fifth harmonic wavelengths. Rieger et al. '634 teach in Figure 6 that fourth harmonic beams may be produced. It would have been obvious to one of ordinary skill in the art at the time of the invention to use higher wavelength harmonics in Rieger et al. '574, as taught by Rieger et al. '634, to extend the laser wavelength into the visible and the ultra-violet. (See Rieger et al. '634 column 5 lines 44-59).

Response to Arguments

Applicant's arguments with respect to claims 3-34, 39, 40, 43-45, 48-50, 53-57, 60-64, 67-70, 73-78, 81-84, 87-92 and 95-98 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 5,546,415.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 703-306-5803. The examiner can normally be reached on Mon-Fri 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 703-308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Davienne Monbleau

DNM

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